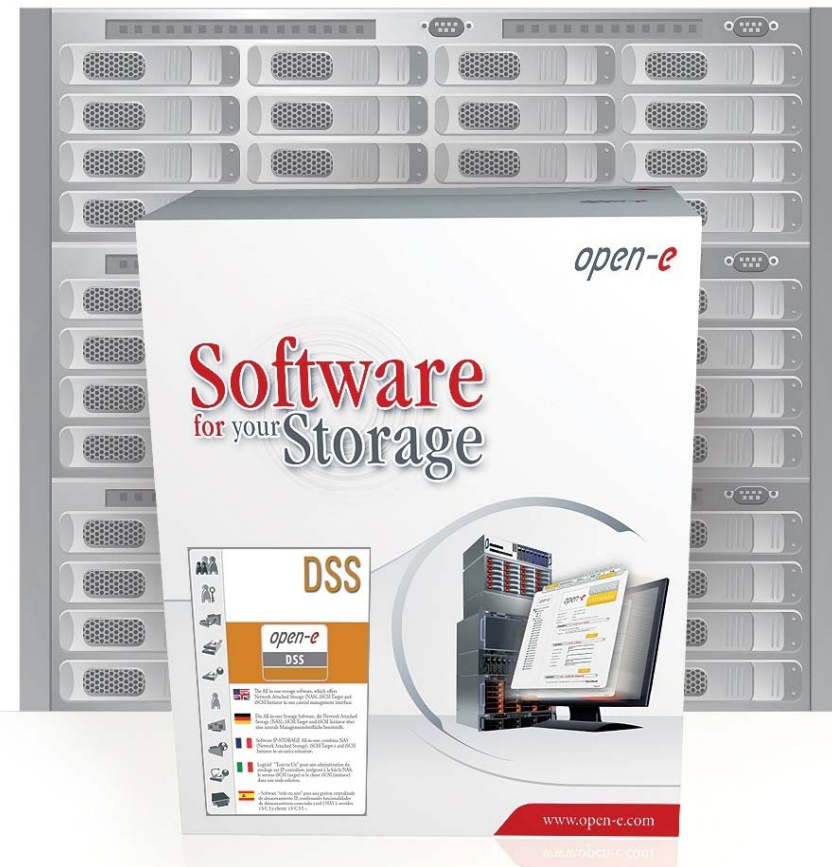


*Step-by-Step Guide to
Synchronous
Volume Replication
(Block Based)
with Failover over a LAN
Supported by Open-E® DSS™*



Synchronous Volume Replication with Failover over a LAN *open-e*

	Replication Mode		Source/Destination			Data Transfer		Volume Type			
	Synchronous	Asynchronous	w/ System	LAN	WAN	File based	Block based	NAS	iSCSI		FC
									File-IO	Block-IO	
Synchronous Volume Replication with Failover over a LAN	✓			✓			✓			✓	

- **Open-E DSS Synchronous Volume Replication with Failover** is a fault tolerance process via iSCSI volume replication, that creates mirrored target data volumes.
 - Data is copied in real-time, and every change is immediately mirrored from the primary server to the secondary storage server.
 - In case of a failure, scheduled maintenance of the primary server, or loss of the primary data source, failover automatically switches operations to the secondary storage server, so processes can be continued as usual.

Synchronous Volume Replication with Failover over a LAN *open-e*

VOLUME REPLICATION WITH FAILOVER BETWEEN TWO SYSTEMS WITHIN ONE LAN

■ Recommended Resources

- Key Hardware (two systems)
 - ✓ x86 compatible
 - ✓ RAID Controller with **Battery Backup Unit**
 - ✓ HDD's
 - ✓ Network Interface Cards
 - ✓ Ping Node (ping node is any permanently (24/7) available host in the network. In particular case the ping node function can be performed by the server storing the data on the iSCSI failover volume).
- Software
 - ✓ Open-E DSS, 2 units

■ Benefits

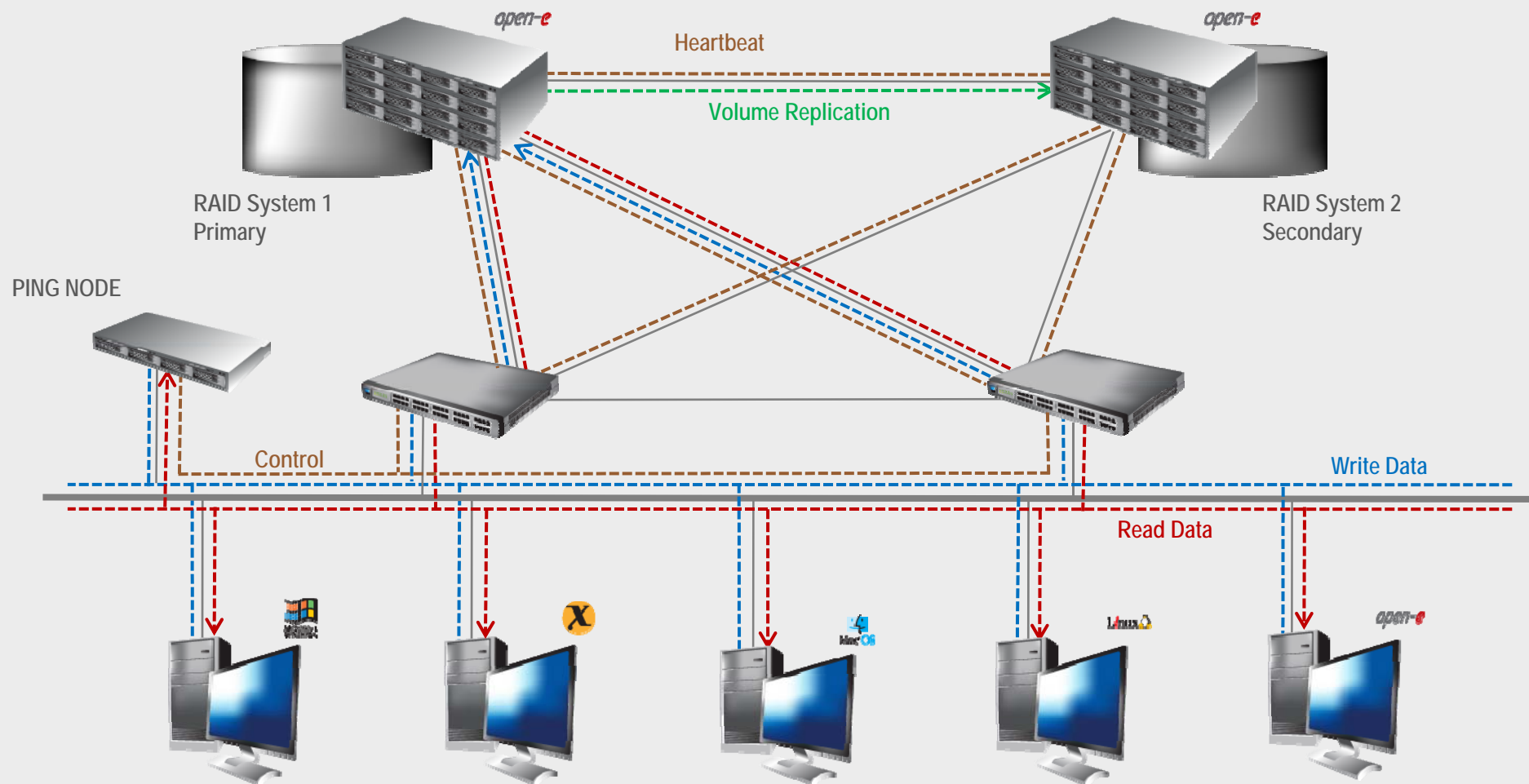
- Eliminate business disruption
- Data Redundancy over a LAN
- Switch Redundancy

■ Disadvantages

- High cost of solution
- Natural disasters (earthquake, fire, flood...) can destroy local systems

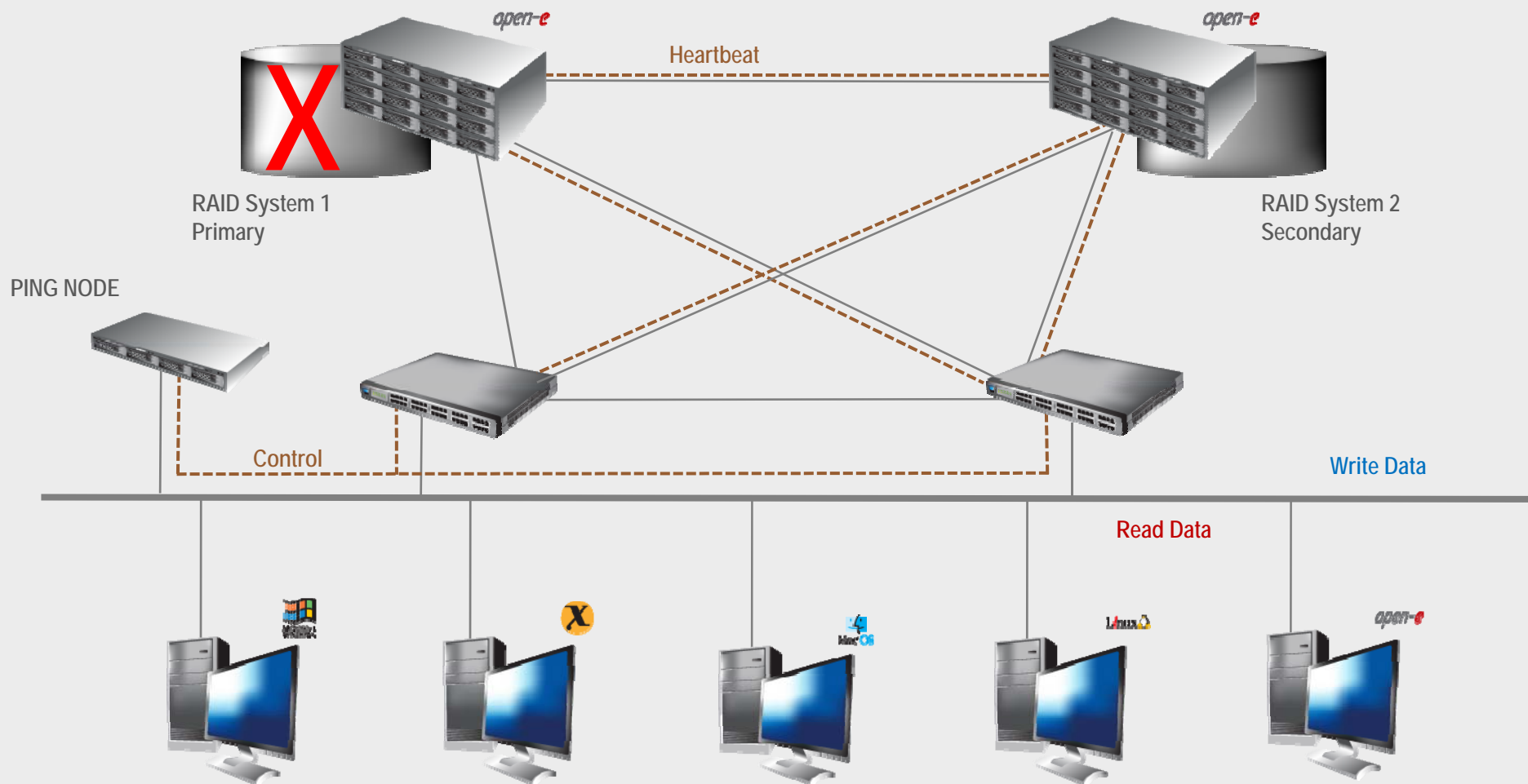
Synchronous Volume Replication with Failover over a LAN *open-e*

- Data is written and read to System 1 (primary)
- Data is continually replicated to System 2 (secondary)



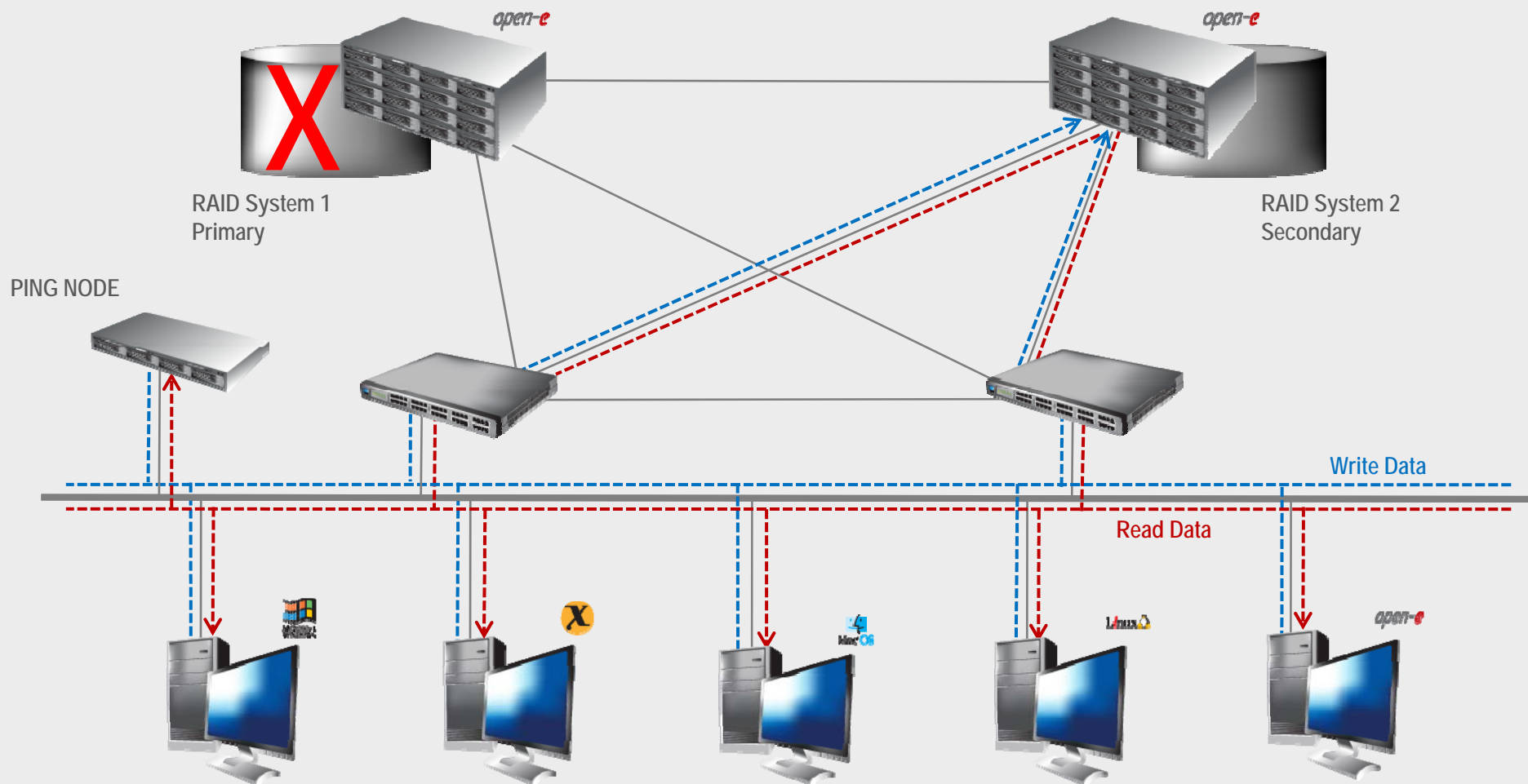
Synchronous Volume Replication with Failover over a LAN *open-e*

- In case of raid array or disk drive error on System 1(primary), the server will send an e-mail notification to the administrator
- iSCSI Auto Failover determines there is no connection between the servers
- After a few seconds Automatic Failover is executed and users are switched to System 2 (secondary)



Synchronous Volume Replication with Failover over a LAN *open-e*

- After switching, the replicated volume is available on System 2 (secondary)



Synchronous Volume Replication with Failover over a LAN *open-e*

TO SET UP VOLUME REPLICATION WITH FAILOVER, PERFORM THE FOLLOWING STEPS:

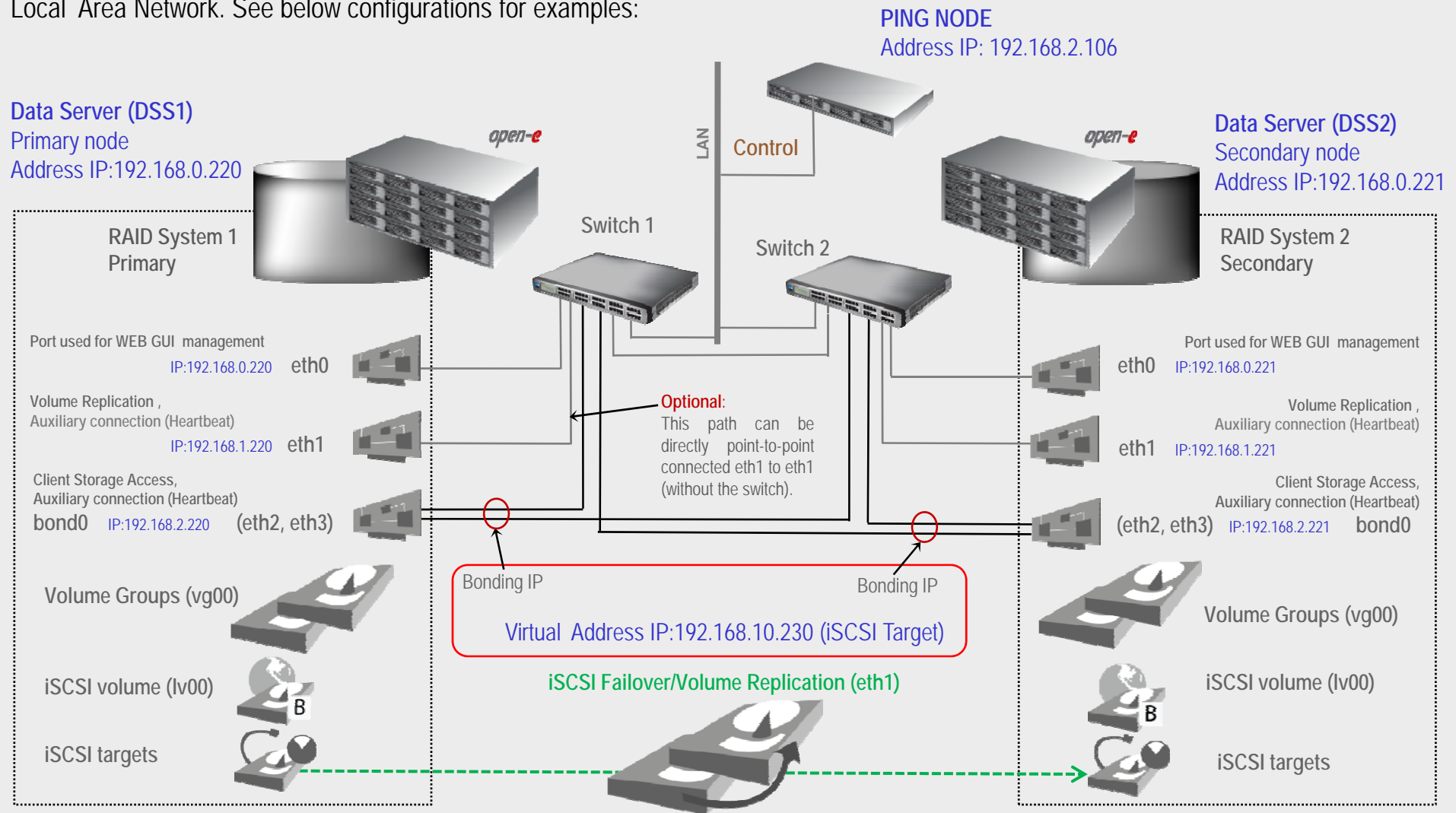
1. Hardware configuration:
 - Settings server names, ethernet ports and bonding on secondary and primary node
2. Configure the Secondary node:
 - Create a Volume Group, iSCSI Volume
 - Configure Volume Replication mode (destination mode) – settings mirror IP address
3. Configure the Primary node
 - Create a Volume Group, iSCSI Volume
 - Configure Volume Replication mode (source mode) – settings mirror IP address, creating Volume Replication task and start replication task.
4. Create new target on Secondary node
5. Create new target on Primary node
6. Configure virtual IP and Auxiliary connection
7. Configure iSCSI Failover
8. Start Failover Service
9. Test Failover Function
10. Run Failback Function

Synchronous Volume Replication with Failover over a LAN *open-e*

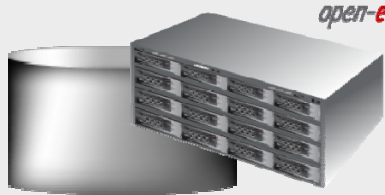
Hardware Requirements:

To run the Volume Replication with Failover, two DSS systems are required. Both servers must be located and working in the Local Area Network. See below configurations for examples:

1. Hardware Configuration



Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS2)
Secondary node
Address IP:192.168.0.221

1. Hardware Configuration

After logging on the DSS please go to „**SETUP**“ tab, „**network**“ and „**Interfaces**“. In „**Server name**“ function enter Server name, in this example „**dss2**“ and click **apply** button. (All connection will be restarted)

logout **DSS** DATA STORAGE SERVER *open-e*

SETUP CONFIGURATION MAINTENANCE STATUS HELP

network administrator H/W RAID S/W RAID Fibre Channel iSCSI Initiator hardware GUI

Interfaces ?

- ☐ eth0
- ☐ eth1
- ☐ eth2
- ☐ eth3

iSCSI Failover ?

- ☐ eth0
- ☐ eth1
- ☐ eth2
- ☐ eth3

Server name ?

Server name:

Comment:

apply

DNS settings ?

DNS

apply

Create new bond interface ?

✓	Primary	Interface	Active	Cable	State
<input type="checkbox"/>	<input type="checkbox"/>	eth0	yes	cable	Single
<input type="checkbox"/>	<input type="checkbox"/>	eth1	yes	cable	Single
<input type="checkbox"/>	<input type="checkbox"/>	eth2	yes	cable	Single
<input type="checkbox"/>	<input type="checkbox"/>	eth3	yes	cable	Single

Create:

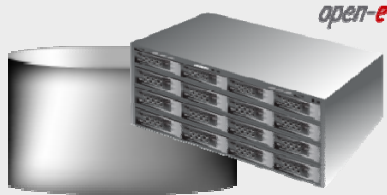
MAC:

☐ DHCP

Event Viewer:

Data Storage Server. All rights reserved

Synchronous Volume Replication with Failover over a LAN *open-e*



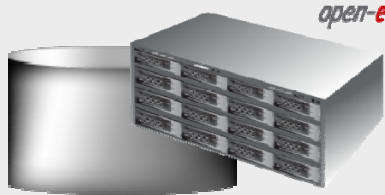
Data Server (DSS2)
Secondary node
Address IP:192.168.0.221

1. Hardware Configuration

Next select **eth0** interface and change address IP from 192.168.0.220 in field IP address to 192.168.0.221, and click **apply** button. (This will restart network configuration).

The screenshot shows the DSS (Data Storage Server) web interface. The top navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and the 'open-e' logo. Below this is a secondary navigation bar with tabs: 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. Under 'SETUP', there are sub-tabs: 'network', 'administrator', 'H/W RAID', 'S/W RAID', 'Fibre Channel', 'iSCSI Initiator', 'hardware', and 'GUI'. The 'network' tab is selected, and the 'Interfaces' sub-tab is active. On the left, a list of interfaces (eth0, eth1, eth2, eth3) is shown, with eth0 selected. Below this, the 'iSCSI Failover' section also lists the same interfaces. The main content area displays the configuration for 'Interface: eth0'. It includes an 'Interface info' section showing 'Intel Corporation 82546GB Gigabit Ethernet Controller (rev 03)'. Below that is an 'IP address' section with a warning message: 'Warning! You are currently connected through this interface.' The configuration options are: 'Active' (checked), 'MAC' (00:04:23:B9:86:FA), 'DHCP' (unchecked), and 'Static' (checked). The 'IP address' field is set to 192.168.0.221, 'Netmask' is 255.255.255.0, 'Broadcast' is auto, and 'Gateway' is empty. An 'apply' button is at the bottom right. At the bottom of the interface, there is an 'Event Viewer' field and a footer that reads 'Data Storage Server. All rights reserved'.

Synchronous Volume Replication with Failover over a LAN *open-e*



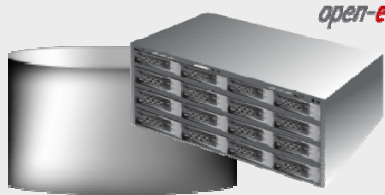
Data Server (DSS2)
Secondary node
Address IP: 192.168.0.221

1. Hardware Configuration

Next select eth1 interface and change IP address from 192.168.1.220 in field IP address to 192.168.1.221 and click **apply** button.

The screenshot shows the open-e DSS web interface. The top navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and the 'open-e' logo. Below this is a secondary navigation bar with tabs: 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. Under 'CONFIGURATION', there are sub-tabs: 'network', 'administrator', 'H/W RAID', 'S/W RAID', 'Fibre Channel', 'iSCSI Initiator', 'hardware', and 'GUI'. The 'network' tab is selected, and the 'Interfaces' sub-tab is active. On the left, a list of interfaces (eth0, eth1, eth2, eth3) is shown, with eth1 selected. Below this is the 'iSCSI Failover' section, also with a list of interfaces (eth0, eth1, eth2, eth3). The main content area displays the configuration for 'Interface: eth1'. It includes an 'Interface info' section showing 'Intel Corporation 82546GB Gigabit Ethernet Controller (rev 03)'. Below that is the 'IP address' section, which has a checkbox for 'Active' (checked), a 'MAC' field with the value '00:04:23:B9:86:FB', and radio buttons for 'DHCP' (unchecked) and 'Static' (checked). The 'Static' configuration includes input fields for 'IP address' (192.168.1.221), 'Netmask' (255.255.255.0), 'Broadcast' (auto), and 'Gateway' (empty). An 'apply' button is located at the bottom right of the configuration area. At the bottom of the interface, there is an 'Event Viewer' field and a footer that reads 'Data Storage Server. All rights reserved'.

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS2)
Secondary node
Address IP:192.168.0.221

1. Hardware Configuration

Again select „Interfaces” and in **Create new bond interface** function check two boxes with **eth2** and **eth3**. In field **Create** select bonding mode. In this example select **New balance-rr**.

Next enter address IP in field **IP address** 192.168.2.221, **Netmask**, and click **create** button.

✓	Primary	Interface	Active	Cable	State
<input type="checkbox"/>	<input type="checkbox"/>	eth0	yes	cable	Single
<input type="checkbox"/>	<input type="checkbox"/>	eth1	yes	cable	Single
<input checked="" type="checkbox"/>	<input type="checkbox"/>	eth2	yes	cable	Single
<input checked="" type="checkbox"/>	<input type="checkbox"/>	eth3	yes	cable	Single

Create:

MAC:

☐ DHCP

☒ Static

Address IP:

Netmask:

Broadcast:

Gateway:

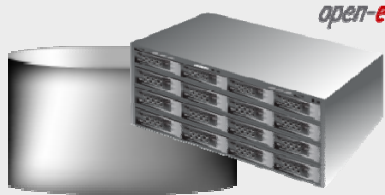
HTTP proxy

☐ Use HTTP proxy

Event Viewer:

Data Storage Server. All rights reserved

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS2)
Secondary node
Address IP:192.168.0.221

1. Hardware Configuration

After reloading page on the dss2 server you have configured bond0. Setting of the network interfaces on the secondary node is finished.

logout **DSS** DATA STORAGE SERVER *open-e*

SETUP CONFIGURATION MAINTENANCE STATUS HELP

network administrator H/W RAID S/W RAID Fibre Channel iSCSI Initiator hardware GUI

Interfaces

- eth0
- eth1
- eth2 (bond0)
- eth3 (bond0)
- bond0**

iSCSI Failover

- eth0
- eth1
- bond0

Server name

Server name: dss2

Comment: Data Storage Server

apply

DNS settings

DNS

apply

Create new bond interface

✓	Primary	Interface	Active	Cable	State
<input type="checkbox"/>	<input type="checkbox"/>	eth0	yes	cable	Single
<input type="checkbox"/>	<input type="checkbox"/>	eth1	yes	cable	Single
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	eth2	yes	cable	bond0
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	eth3	yes	cable	bond0

Create: New balance-rr

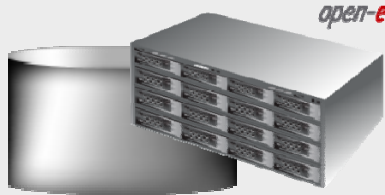
MAC: 02:1A:F4:A7:37:B3

☐ DHCP

Event Viewer: [x]

Data Storage Server. All rights reserved

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

1. Hardware Configuration

After logging on the primary node please go to „**SETUP**“ tab, „**network**“ and „**Interfaces**“. In „**Server name**“ function enter Server name. In this example enter **dss1** and click **apply** button. (All connection will be restarted).

logout **DSS** DATA STORAGE SERVER *open-e*

SETUP CONFIGURATION MAINTENANCE STATUS HELP

network administrator H/W RAID S/W RAID Fibre Channel iSCSI Initiator hardware GUI

Interfaces

- eth0
- eth1
- eth2
- eth3

iSCSI Failover

- eth0
- eth1
- eth2
- eth3

Server name

Server name:

Comment:

apply

DNS settings

DNS:

apply

Create new bond interface

✓	Primary	Interface	Active	Cable	State
<input type="checkbox"/>	<input type="checkbox"/>	eth0	yes	cable	Single
<input type="checkbox"/>	<input type="checkbox"/>	eth1	yes	cable	Single
<input type="checkbox"/>	<input type="checkbox"/>	eth2	yes	cable	Single
<input type="checkbox"/>	<input type="checkbox"/>	eth3	yes	cable	Single

Create:

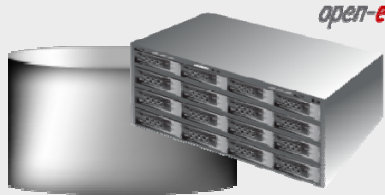
MAC:

☐ DHCP

Event Viewer:

Data Storage Server. All rights reserved

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP: 192.168.0.220

1. Hardware Configuration

Again select Interfaces and in Create new bond interface function check two boxes with **eth2** and **eth3**. In field Create select mode for bonding. In this example selected **New balance-rr**.

Next enter address IP in field **IP address** 192.168.2.220, **Netmask**, and click **create** button.

✓	Primary	Interface	Active	Cable	State
<input type="checkbox"/>	<input type="checkbox"/>	eth0	yes	cable	Single
<input type="checkbox"/>	<input type="checkbox"/>	eth1	yes	cable	Single
<input checked="" type="checkbox"/>	<input type="checkbox"/>	eth2	yes	cable	Single
<input checked="" type="checkbox"/>	<input type="checkbox"/>	eth3	yes	cable	Single

Create:

MAC:

☐ DHCP

☒ Static

Address IP:

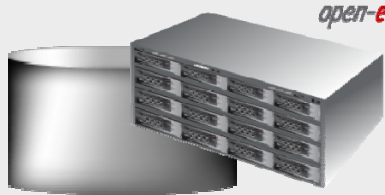
Netmask:

Broadcast:

Gateway:

☐ Use HTTP proxy

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

1. Hardware Configuration

After reloading page on the dss1 server you have configured **bond0**. Setting of the network interfaces on the secondary node is finished.

logout **DSS** DATA STORAGE SERVER *open-e*

SETUP CONFIGURATION MAINTENANCE STATUS HELP

network administrator H/W RAID S/W RAID Fibre Channel iSCSI Initiator hardware GUI

Interfaces

- eth0
- eth1
- eth2 (bond0)
- eth3 (bond0)
- bond0**

iSCSI Failover

- eth0
- eth1
- bond0

Server name

Server name:

Comment:

DNS settings

DNS:

Create new bond interface

✓	Primary	Interface	Active	Cable	State
<input type="checkbox"/>	<input type="checkbox"/>	eth0	yes	cable	Single
<input type="checkbox"/>	<input type="checkbox"/>	eth1	yes	cable	Single
<input type="checkbox"/>	<input type="checkbox"/>	eth2	yes	cable	bond0
<input type="checkbox"/>	<input type="checkbox"/>	eth3	yes	cable	bond0

Create:

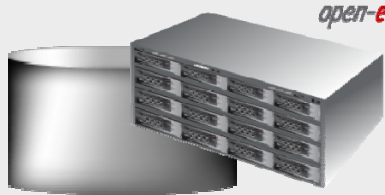
MAC:

☐ DHCP

Event Viewer:

Data Storage Server. All rights reserved

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS2)
Secondary node
Address IP:192.168.0.221

2. Configure the Secondary node

Under the „CONFIGURATION“ tab, select „volume manager“ and next Vol. Groups.



Volume Groups (vg00)

In Unit manager function add the selected physical units (Unit S000 or other) to create a new volume group (in this case, vg00) and click **apply** button

logout **DSS** DATA STORAGE SERVER *open-e*

SETUP **CONFIGURATION** MAINTENANCE STATUS HELP

volume manager NAS settings NAS resources iSCSI target manager FC target manager

Vol. groups

Unit rescan

rescan

Unit manager

✓	Unit	Size (GB)	Serial number	Status
<input checked="" type="checkbox"/>	Unit S000	230.08	N/A	available

Action: new volume group

Name: vg00

apply

Vol. replication

Drive identifier

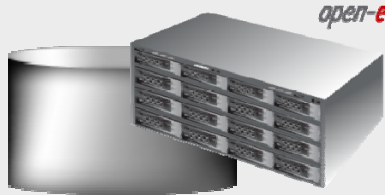
✓	Unit	Serial number	Status
<input type="checkbox"/>	Unit S000	N/A	

apply

Event Viewer: [icon]

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Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS2)
Secondary node
Address IP:192.168.0.221

2. Configure the Secondary node

Select the appropriate volume group (**vg00**) from the list on the left and create a **new iSCSI volume** of the required size. This logical volume will be the destination of the replication process.

Next check the box with **Use volume replication**

After assigning an appropriate amount of space for the iSCSI volume, click the **apply** button

The screenshot shows the 'DSS DATA STORAGE SERVER' web interface. The 'CONFIGURATION' tab is active, and the 'volume manager' sub-tab is selected. On the left, under 'Vol. groups', the 'vg00' group is highlighted. Below it, the 'Vol. replication' section is visible. On the right, the 'Volume group: vg00' configuration page is shown. It includes a table of system volumes and options for creating a new iSCSI volume.

System volumes	Size (GB)
Reserved Pool	4.00
Reserved for snapshots	0.00
Reserved for system	1.00
Reserved for replication	0.00
Free	225.03

Action: new iSCSI volume
Options: Just create volume

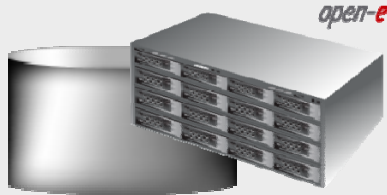
☒ Use volume replication

☐ File I/O
☒ Initialize
☒ Block I/O

add: 10.00 GB (+0.12 GB for replication)

apply

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS2)
Secondary node
Address IP:192.168.0.221

2. Configure the Secondary node

The destination iSCSI Volume Block I/O is now configured.



iSCSI volume (lv0000)

logout **DSS** DATA STORAGE SERVER *open-e*

SETUP CONFIGURATION MAINTENANCE STATUS HELP

volume manager NAS settings NAS resources iSCSI target manager FC target manager

Vol. groups ?

vg00

Volume group: vg00

? Volume manager

Info
Logical volume lv0000 has been created successfully.

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000	B		✓		N/A	10.00
System volumes						Size (GB)
Reserved Pool						4.00
Reserved for snapshots						0.00
Reserved for system						1.00
Reserved for replication						0.13
Free						214.91

Action: new NAS volume

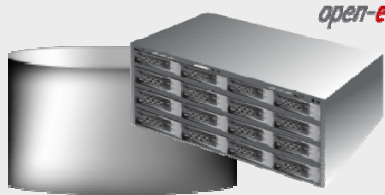
☐ Use volume replication
☐ WORM

0 214.91

Event Viewer: [icon]

Data Storage Server. All rights reserved

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS2)
Secondary node
Address IP:192.168.0.221

2. Configure the Secondary node

Now, select the **Vol. replication** and check the box under **Destination** and click the **apply** button

Next, under **Mirror Server IP** function, enter the IP address of the Primary node (in our example, this would be 192.168.1.220) and click the **apply** button

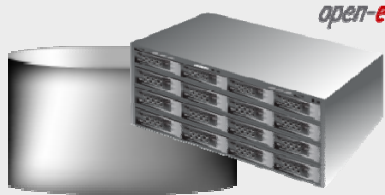
NOTE:

The Mirror server IP Address must be on the same subnet in order for the replication to communicate. VPN connections can work providing you are not using a NAT. Please follow example:

- Source: 192.168.1.220
- Destination: 192.168.1.221

The screenshot shows the 'DSS DATA STORAGE SERVER' web interface. The 'CONFIGURATION' tab is active, and the 'volume manager' sub-tab is selected. On the left, under 'Vol. groups', 'vg00' is listed. Below it, the 'Vol. replication' section is expanded. In the main area, the 'Volume replication mode' section shows a table with columns: Logical Volume, Init, Source, Destination, and Clear metadata. The row for 'lv0000' shows 'done' under Init, and the 'Destination' checkbox is checked. An 'apply' button is below this table. The 'Mirror server IP' section has an 'IP address' field containing '192.168.1.220' and a 'WAN' checkbox that is unchecked. Another 'apply' button is below. The 'Create new volume replication task' section has an info message: 'Mirror Server IP is not set.' The 'Replication tasks manager' section has an info message: 'No tasks have been found.' The footer of the interface says 'Data Storage Server. All rights reserved.'

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

3. Configure the Primary node

Under the „CONFIGURATION“ tab, select „volume manager“ and next Vol. Groups

Add the selected physical units (Unit MD0 or other) to create a new volume group (in this case, vg00) and click **apply** button



Volume Groups (vg00)

DSS DATA STORAGE SERVER *open-e*

logout | **SETUP** | **CONFIGURATION** | MAINTENANCE | STATUS | HELP

volume manager | NAS settings | NAS resources | iSCSI target manager | FC target manager

Vol. groups ?

Unit rescan

rescan

Unit manager

✓	Unit	Size (GB)	Serial number	Status
<input type="checkbox"/>	Unit MD0	465.77	N/A	available

Action: new volume group
Name: vg00

apply

Vol. replication ?

Drive identifier

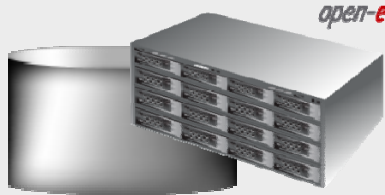
✓	Unit	Serial number	Status
<input type="checkbox"/>	Unit S001	5RY13SBZ	
<input type="checkbox"/>	Unit S000	9RY1GP7W	

apply

Event Viewer: [icon]

Data Storage Server. All rights reserved

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

3. Configure the Primary node

Select the appropriate volume group (**vg00**) from the list on the left and create a **new iSCSI volume** of the required size. This logical volume will be the destination of the replication process

Next, check box **Use volume replication**

After assigning an appropriate amount of space for the iSCSI volume, click the **apply** button

The screenshot shows the 'DSS DATA STORAGE SERVER' web interface. The 'CONFIGURATION' tab is active, and the 'volume manager' sub-tab is selected. On the left, under 'Vol. groups', 'vg00' is selected. Below it, 'Vol. replication' is also visible. The main area shows 'Volume group: vg00' and a 'Volume manager' section. A table lists system volumes with their sizes in GB:

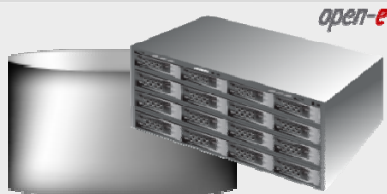
System volumes	Size (GB)
Reserved Pool	4.00
Reserved for snapshots	0.00
Reserved for system	1.00
Reserved for replication	0.00
Free	460.72

Below the table, the 'Action' is set to 'new iSCSI volume' and 'Options' is 'Just create volume'. The 'Use volume replication' checkbox is checked. Under 'File I/O', 'Initialize' is checked. Under 'Block I/O', a slider is set to 10.00 GB. At the bottom, there is an 'apply' button.

NOTE:

The source and destination volumes must be of identical size.

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

3. Configure the Primary node

The destination iSCSI Volume Block I/O is now configured.



iSCSI volume (lv0000)

open-e

logout **DSS** DATA STORAGE SERVER

SETUP CONFIGURATION MAINTENANCE STATUS HELP

volume manager NAS settings NAS resources iSCSI target manager FC target manager

Vol. groups ?

vg00

Volume group: vg00

Volume manager

Info
Logical volume lv0000 has been created successfully.

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000	B		✓		N/A	10.00
System volumes						Size (GB)
Reserved Pool						4.00
Reserved for snapshots						0.00
Reserved for system						1.00
Reserved for replication						0.13
Free						450.59

Action: new NAS volume

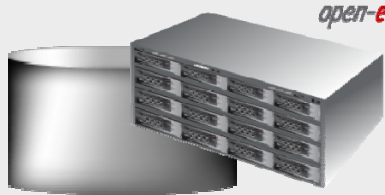
☐ Use volume replication
☐ WORM

0 450.59

Event Viewer:

Data Storage Server. All rights reserved

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

3. Configure the Primary node

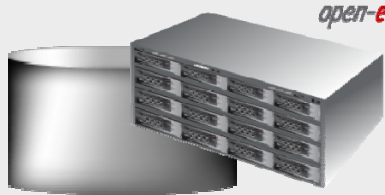
Now, select Vol. replication, and check the box under **Source** and click the **apply** button

Next , under **Mirror Server IP** function, enter the IP address of the Secondary node (in our example this would be 192.168.1.221) and click the **apply** button

The screenshot shows the open-e Data Storage Server (DSS) web interface. The top navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and the 'open-e' logo. Below this is a sub-navigation bar with 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The 'CONFIGURATION' tab is active, and the 'volume manager' sub-tab is selected. The left sidebar shows 'Vol. groups' with 'vg00' and 'Vol. replication'. The main content area is divided into three sections: 'Volume replication mode', 'Mirror server IP', and 'Create new volume replication task'. The 'Volume replication mode' section contains a table with columns 'Logical Volume', 'Init', 'Source', 'Destination', and 'Clear metadata'. The row for 'lv0000' shows 'Init' as 'done', 'Source' as checked, and 'Destination' and 'Clear metadata' as unchecked. An 'apply' button is below the table. The 'Mirror server IP' section has an 'IP address' field with '192.168.1.221' and a 'WAN' checkbox. An 'apply' button is below. The 'Create new volume replication task' section shows an 'Info' message: 'Mirror Server IP is not set.' The 'Replication tasks manager' section shows an 'Info' message: 'No tasks have been found.' At the bottom, there is an 'Event Viewer' field and a footer that reads 'Data Storage Server. All rights reserved'.


Logical Volume	Init	Source	Destination	Clear metadata
lv0000	done	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Synchronous Volume Replication with Failover over a LAN *open-e*

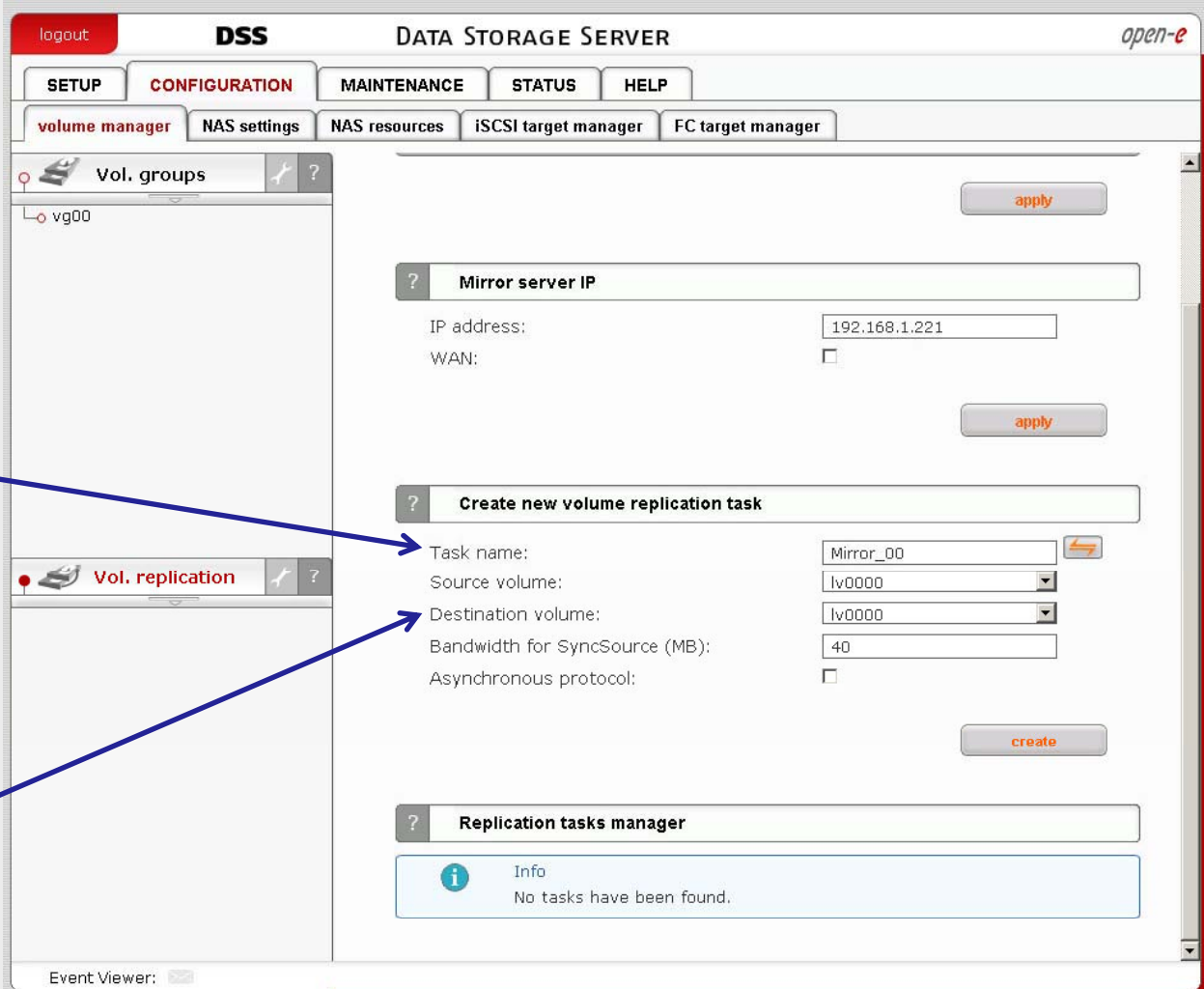


Data Server (DSS1)
Primary node
Address IP:192.168.0.220

3. Configure the Primary node

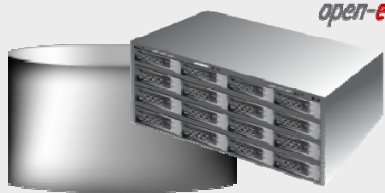
Enter the task name in field
Task name next click on the
button 

In the Destination volume
field select the appropriate
volume (in this example,
lv0000) and click **create** to
confirm.




The screenshot shows the open-e Data Storage Server (DSS) web interface. The top navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and the 'open-e' logo. Below this are tabs for 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The 'CONFIGURATION' tab is active, and within it, the 'volume manager' sub-tab is selected. The left sidebar shows 'Vol. groups' with 'vg00' and 'Vol. replication'. The main content area has two sections: 'Mirror server IP' and 'Create new volume replication task'. The 'Mirror server IP' section has fields for 'IP address' (192.168.1.221) and 'WAN' (unchecked), with an 'apply' button. The 'Create new volume replication task' section has fields for 'Task name' (Mirror_00), 'Source volume' (lv0000), 'Destination volume' (lv0000), 'Bandwidth for SyncSource (MB)' (40), and 'Asynchronous protocol' (unchecked), with a 'create' button. A 'Replication tasks manager' section at the bottom shows an info message: 'No tasks have been found.' Blue arrows point from the text boxes to the 'Task name' and 'Destination volume' fields.

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

3. Configure the Primary node

Now, in the **Replication task manager** function, click on  button under to start the Replication task on the Primary node

DSS DATA STORAGE SERVER

logout SETUP CONFIGURATION MAINTENANCE STATUS HELP

volume manager NAS settings NAS resources iSCSI target manager FC target manager

Vol. groups

- vg00

Vol. replication

- Mirror_00

Logical Volume	Init	Source	Destination	Clear metadata
lv0000	done	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

apply

Mirror server IP

IP address: 192.168.1.221




WAN: ☐

apply

Create new volume replication task

Info
No volumes with replication functionality found or all volumes have a task assigned already.

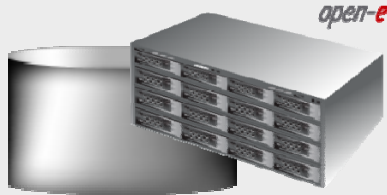
Replication tasks manager

Name	Start time	Action
Mirror_00	n/a	  

Event Viewer: [icon]

Data Storage Server. All rights reserved

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

3. Configure the Primary node

In the Replication tasks manager function information is available about the current running replication task.

DSS DATA STORAGE SERVER *open-e*

logout | **CONFIGURATION** | MAINTENANCE | STATUS | HELP

volume manager | NAS settings | NAS resources | iSCSI target manager | FC target manager

Vol. groups

- vg00

Vol. replication

- Mirror_00

lv0000 **done** ☒ ☐ ☐

Mirror server IP

IP address: 192.168.1.221
WAN: ☐

Create new volume replication task

Info
No volumes with replication functionality found or all volumes have a task assigned already.

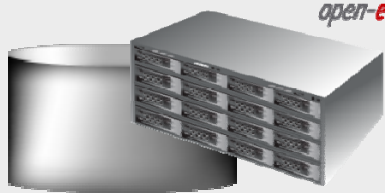
Replication tasks manager

Name	Start time	Action
Mirror_00	2009-09-10 21:52:03	
Source volume: lv0000		
Destination volume: lv0000		
Destination IP: 192.168.1.221		
Protocol type: Synchronous		

Event Viewer:

Data Storage Server. All rights reserved


Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

3. Configure the Primary node

Under the „STATUS“ tab,
select „Tasks“ and Volume
Replication

Click on the  button with
task name (in this case
Mirror_00) to display detailed
information on the current
replication task

The screenshot shows the DSS web interface with the 'STATUS' tab selected. The 'Tasks' section is expanded, showing a list of tasks including 'Volume Replication'. The 'Volume Replication' task is selected, and its details are displayed in the 'Running tasks' section. The details include the task name 'Mirror_00', type 'Volume replication', and start time '2009-09-10 21:52:03'. Below this, the 'Tasks log' section shows a log entry for the same task, with status 'OK' and action 'Started'.

Name	Type	Start time
Mirror_00	Volume replication	2009-09-10 21:52:03

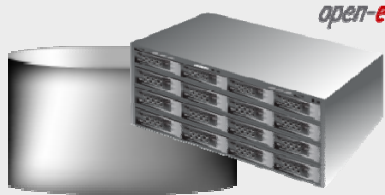
Protocol type: Synchronous
Connection: Connected
Source info:
Logical volume: lv0000
Consistency: Consistent
Destination info:
Logical volume: lv0000
Consistency: Consistent
IP address: 192.168.1.221

Time	Name	Type	Status	Action
2009-09-10 21:52:09	Mirror_00	Volume replication	OK	Started

NOTE:

Please allow the replication task to complete similar to above with status being "Consistent" before writing to the iSCSI Logical Volume.

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS2)
Secondary node
Address IP:192.168.0.221

4. Create new target on the Secondary node

Choose „CONFIGURATION“,
„iSCSI target manager“ and
„Targets“ from the menu

In the Create new target
function, uncheck the box
Target Default Name,
and enter a name for the new target
in the Name field and click
apply to confirm

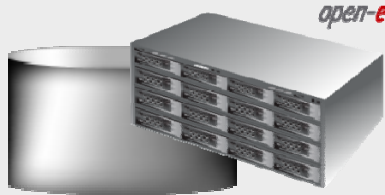
iSCSI targets



NOTE:

Both systems must have the same Target name.


Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS2)
Secondary node
Address IP:192.168.0.221

4. Create new target on the Secondary node

Select target0 within the Targets field.

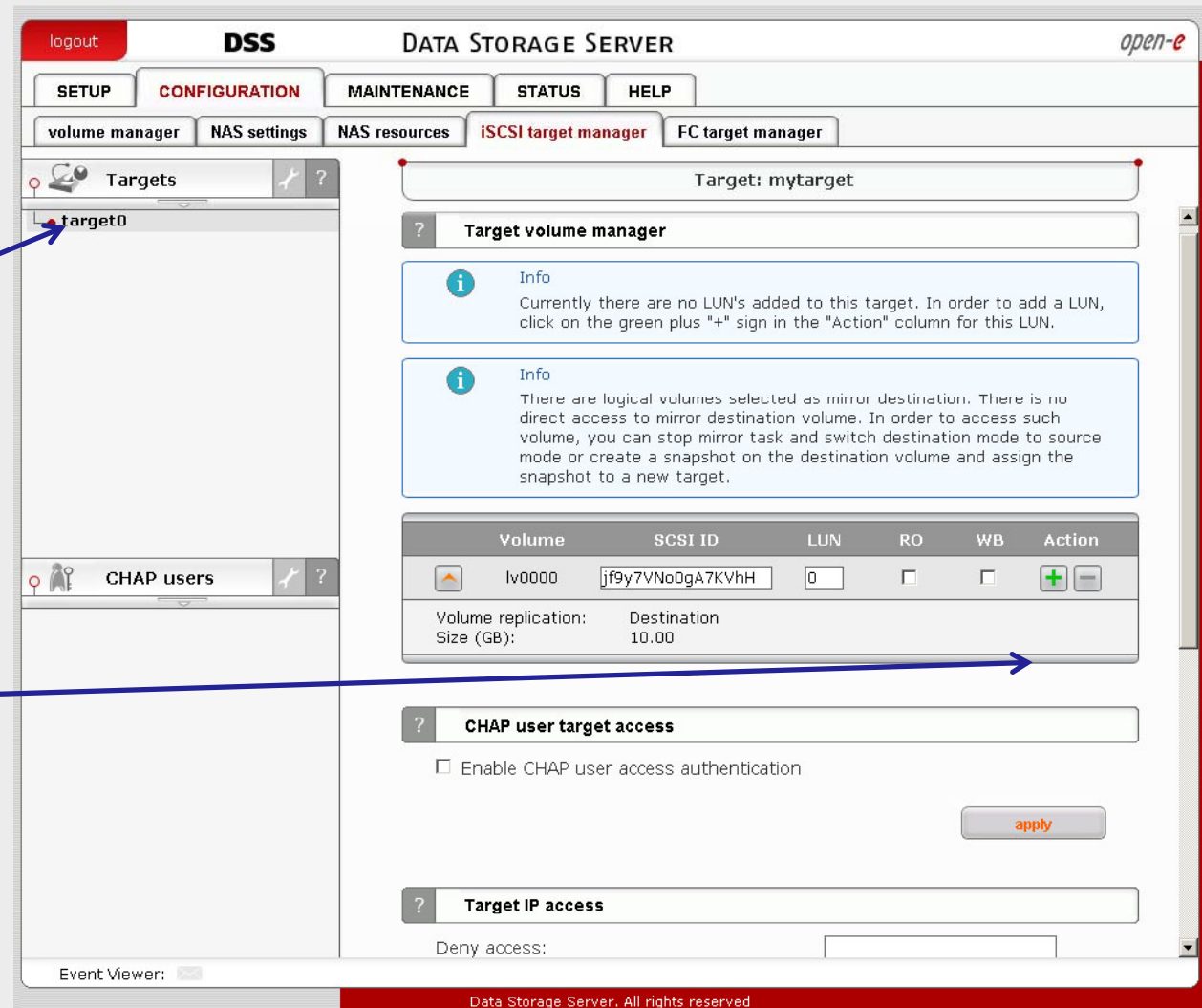
To assign a volume to the target, click the button  located under **Action**.



NOTE:

Both systems must have the same SCSI ID and LUN#

WARNING:

Please do not switch on the write back (WB) cache !



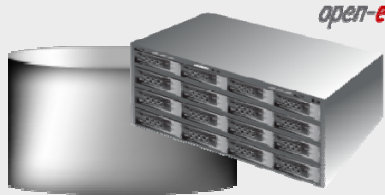
Volume	SCSI ID	LUN	RO	WB	Action
lv0000	if9y7VNo0gA7KVhH	0	<input type="checkbox"/>	<input type="checkbox"/>	 

Volume replication: Destination
Size (GB): 10.00

CHAP user target access
☐ Enable CHAP user access authentication
apply

Target IP access
Deny access:

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

5. Create new target on the Primary node

Choose „CONFIGURATION“ and „iSCSI target manager“ and „Targets“ from the menu

In the Create new target function, uncheck the box Target Default Name, and enter a name for the new target in the Name field and click **apply** to confirm

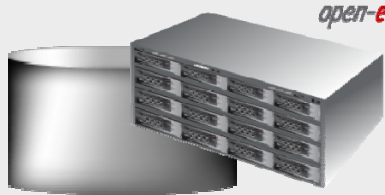
iSCSI targets



NOTE:

Both systems must have the same Target name.


Synchronous Volume Replication with Failover over a LAN *open-e*





Data Server (DSS1)
Primary node
Address IP:192.168.0.220

5. Create new target on the Primary node

Select the target0 within the Targets field

To assign a volume to the target, click the button  located under **Action**.

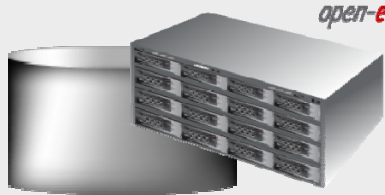
The screenshot shows the 'iSCSI target manager' configuration page. The 'Targets' list on the left contains 'target0'. The main panel shows configuration for 'Target: mytarget'. It includes a 'Target volume manager' section with an info message and a table of volumes. The table has columns for Volume, SCSI ID, LUN, RO, WB, and Action. The first row shows 'lv0000' with SCSI ID 'EEsFBpIZr47som1a' and LUN '0'. The 'Action' column for this row contains a green plus icon and a minus icon. Below the table is a 'CHAP user target access' section with a checkbox for 'Enable CHAP user access authentication' and an 'apply' button. Further down is a 'Target IP access' section with input fields for 'Deny access:' and 'Allow access:', and another 'apply' button. At the bottom is a 'Rename target' section. The footer of the interface says 'Data Storage Server. All rights reserved'.

Volume	SCSI ID	LUN	RO	WB	Action
lv0000	EEsFBpIZr47som1a	0	<input type="checkbox"/>	<input type="checkbox"/>	 

WARNING:

Please do not switch on the write back cache (WB) !

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

6. Configure Virtual IP and Auxiliary connection

Now, select the **bond0** within **iSCSI Failover**.
In the **Virtual IP Settings** function check box **Enable virtual IP** and enter IP address, Netmask, Broadcast, and click the **apply** button.

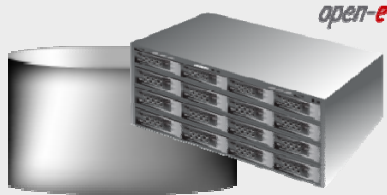
In the **Auxiliary connection** function check box **Use this network interface to communicate between the nodes** and click the **apply** button.

NOTE:

There need to be at least two *auxiliary connections*. The interface with the virtual IP can also serve as one of the auxiliary connections. Please set the Virtual IP Address in a different network subnet then the physical IP Address. To have additional iSCSI Failover systems, please set this pair in a different network subnet from the other iSCSI Failover systems. This limitation will be removed in the future.

The screenshot shows the open-e Data Storage Server (DSS) web interface. The top navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and the 'open-e' logo. Below this is a sub-navigation bar with tabs: 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The 'CONFIGURATION' tab is active, and within it, the 'network' sub-tab is selected. The main content area is divided into two sections: 'Interfaces' and 'iSCSI Failover'. The 'Interfaces' section lists several network interfaces: 'eth0', 'eth1', 'eth2 (bond0)', 'eth3 (bond0)', and 'bond0'. The 'iSCSI Failover' section lists 'eth0', 'eth1', and 'bond0'. The 'Virtual IP Settings' section is visible, showing a MAC address of '02:d2:d3:a3:4a:0d', a checked 'Enable virtual IP' checkbox, and input fields for IP address (192.168.0.230), Netmask (255.255.255.0), and Broadcast (192.168.0.255). An 'apply' button is present. The 'Auxiliary connection' section is also visible, with a checked checkbox 'Use this network interface to communicate between the nodes' and an 'apply' button. Arrows from the text boxes point to the 'bond0' interface in the 'Interfaces' list and the 'apply' button in the 'Auxiliary connection' section.

Synchronous Volume Replication with Failover over a LAN *open-e*



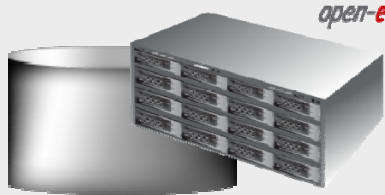
Data Server (DSS1)
Primary node
Address IP:192.168.0.220

6. Configure Virtual IP and Auxillary connection

Now, select the eth1 within iSCSI Failover.
In the Auxiliary connection function check box Use this network interface to communicate between the nodes and click the **apply** button.

The screenshot shows the DSS (Data Storage Server) web interface. The top navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and the 'open-e' logo. Below this is a secondary navigation bar with tabs: 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The 'network' tab is selected, and within it, the 'administrator' sub-tab is active. The main content area is divided into two panels. The left panel, titled 'Interfaces', lists network interfaces: 'eth0', 'eth1', 'eth2 (bond0)', 'eth3 (bond0)', and 'bond0'. The right panel contains two sections: 'Virtual IP Settings' and 'Auxiliary connection'. The 'Virtual IP Settings' section shows a MAC address of '00:15:17:18:e7:f5' and an unchecked checkbox for 'Enable virtual IP'. The 'Auxiliary connection' section has a checked checkbox for 'Use this network interface to communicate between the nodes'. Both sections have an 'apply' button. Below the 'Interfaces' panel is another section titled 'iSCSI Failover' with a list of interfaces: 'eth0', 'eth1', and 'bond0'. The 'eth1' interface is selected, indicated by a red dot. At the bottom of the interface, there is an 'Event Viewer' field and a footer that reads 'Data Storage Server. All rights reserved'.

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS2)
Secondary node
Address IP: 192.168.0.221

6. Configure Virtual IP and Auxiliary connection

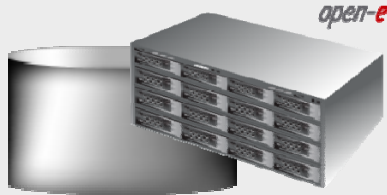
Choose, „**SETUP**“ and „**network**“ and „**Interface**“ from the menu

Now, select the **bond0** within **iSCSI Failover**.
In the **Virtual IP Settings** function check the box **Enable virtual IP** and enter IP address, Netmask, Broadcast, and click the **apply** button.

In the **Auxiliary connection** function check box **Use this network interface to communicate between the nodes** and click the **apply** button.

The screenshot shows the open-e Data Storage Server (DSS) web interface. The top navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and the 'open-e' logo. Below this is a secondary navigation bar with tabs: 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. Under the 'SETUP' tab, there are sub-tabs: 'network', 'administrator', 'H/W RAID', 'S/W RAID', 'Fibre Channel', 'iSCSI Initiator', 'hardware', and 'GUI'. The 'network' sub-tab is active, and the 'Interfaces' section is selected. It shows a list of network interfaces: eth0, eth1, eth2 (bond0), eth3 (bond0), and bond0. The 'iSCSI Failover' section is also visible, showing a list of interfaces: eth0, eth1, and bond0. The 'Virtual IP Settings' section is expanded, showing the MAC address 02:60:08:28:72:ab, and checkboxes for 'Enable virtual IP' (checked), 'IP address' (192.168.0.230), 'Netmask' (255.255.255.0), and 'Broadcast' (192.168.0.255). An 'apply' button is present. The 'Auxiliary connection' section is also expanded, showing a checkbox for 'Use this network interface to communicate between the nodes.' (checked) and an 'apply' button. At the bottom, there is an 'Event Viewer' field and a footer that reads 'Data Storage Server. All rights reserved'.

Synchronous Volume Replication with Failover over a LAN *open-e*



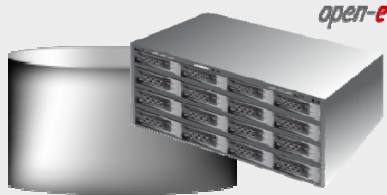
Data Server (DSS2)
Secondary node
Address IP:192.168.0.221

6. Configure Virtual IP and Auxillary connection

Now, select the eth1 within iSCSI Failover.
In the **Auxiliary connection** function check box **Use this network interface to communicate between the nodes** and click the **apply** button.

The screenshot shows the DSS (Data Storage Server) web interface. The top navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and the 'open-e' logo. Below this is a secondary navigation bar with tabs: 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. Under 'CONFIGURATION', there are sub-tabs: 'network', 'administrator', 'H/W RAID', 'S/W RAID', 'Fibre Channel', 'iSCSI Initiator', 'hardware', and 'GUI'. The 'network' tab is selected, and the 'Interfaces' sub-tab is active. It lists network interfaces: eth0, eth1, eth2 (bond0), eth3 (bond0), and bond0. Below this, the 'iSCSI Failover' sub-tab is active, showing a list of interfaces: eth0, eth1 (highlighted with a red dot), and bond0. To the right, the 'Virtual IP Settings' section shows a MAC address of 00:15:17:18:e7:f5 and an unchecked checkbox for 'Enable virtual IP'. Below that, the 'Auxiliary connection' section has a checked checkbox for 'Use this network interface to communicate between the nodes'. Both sections have an 'apply' button. At the bottom, there is an 'Event Viewer' field and a footer that reads 'Data Storage Server. All rights reserved'.

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

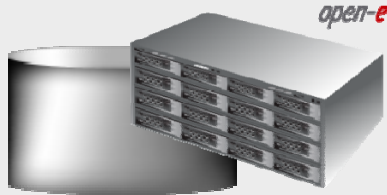
7. Configure iSCSI Failover

Now, select iSCSI Failover

In the Failover configuration function, check the box **Enable iSCSI failover functionality** and enter the Secondary node IP address and the Ping Node IP and click the **apply** button

The screenshot shows the open-e Data Storage Server (DSS) web interface. The top navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and the 'open-e' logo. Below this is a secondary navigation bar with tabs: 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. Under 'CONFIGURATION', there are sub-tabs: 'network', 'administrator', 'H/W RAID', 'S/W RAID', 'Fibre Channel', 'iSCSI Initiator', 'hardware', and 'GUI'. The 'iSCSI Initiator' tab is selected, and the 'Failover' sub-tab is active. The left sidebar shows a tree view with 'Interfaces' and 'iSCSI Failover' (highlighted in red). The main content area is divided into three sections: 'Failover status', 'Failover configuration', and 'Failover Tasks'. The 'Failover status' section has an 'Info' box stating that failover statistics are unavailable because the iSCSI Failover service is disabled. The 'Failover configuration' section has a checkbox 'Enable iSCSI failover functionality' which is checked. Below it, there are two radio button options: 'Primary node on localhost' (selected) and 'Secondary node on localhost'. For the 'Primary node on localhost' option, there are input fields for 'Secondary node IP:' (containing '192.168.2.221') and 'Ping node IP:' (containing '192.168.2.106'). There are also checkboxes for 'Show advanced' which are currently unchecked. An 'apply' button is at the bottom right of this section. The 'Failover Tasks' section has an 'Info' box stating that asynchronous replication tasks will not be displayed. At the bottom of the interface, there is an 'Event Viewer' section and a footer that reads 'Data Storage Server. All rights reserved'.

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS2)
Secondary node
Address IP:192.168.0.221

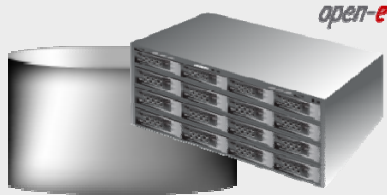
7. Configure iSCSI Failover

Now, select iSCSI Failover

Now, in Failover configuration function, check the box **Enable iSCSI failover functionality** and enter Primary node IP address and click the **apply** button

The screenshot shows the open-e Data Storage Server (DSS) web interface. The top navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and the 'open-e' logo. Below this is a secondary navigation bar with tabs: 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. Under 'CONFIGURATION', there are sub-tabs: 'network', 'administrator', 'H/W RAID', 'S/W RAID', 'Fibre Channel', 'iSCSI Initiator', 'hardware', and 'GUI'. The 'iSCSI Initiator' tab is selected, and the 'Failover' sub-tab is active. The left sidebar shows a tree view with 'Interfaces' and 'iSCSI Failover' (highlighted with a red dot). The main content area is divided into three sections: 'Failover status', 'Failover configuration', and 'Failover Tasks'. The 'Failover status' section contains an 'Info' box stating that failover statistics are unavailable. The 'Failover configuration' section has a checkbox 'Enable iSCSI failover functionality' which is checked. Below it, there are two radio button options: 'Primary node on localhost' and 'Secondary node on localhost' (selected). The 'Secondary node on localhost' option has a text input field for 'Primary node IP' containing '192.168.2.220'. There is also a 'Show advanced' checkbox. An 'apply' button is at the bottom right of this section. The 'Failover Tasks' section contains an 'Info' box about asynchronous replication tasks. At the bottom, there are two search bars for 'iSCSI Tasks' and 'Failover Tasks'. The footer of the interface says 'Data Storage Server. All rights reserved'.

Synchronous Volume Replication with Failover over a LAN *open-e*



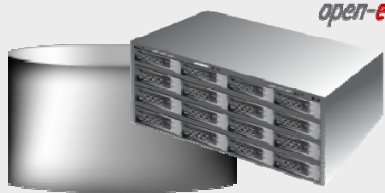
Data Server (DSS1)
Primary node
Address IP:192.168.0.220

7. Configure iSCSI Failover

Move the iSCSI Tasks to be used for the failover service to the Failover Tasks area by clicking ➡ button and click **apply**

The screenshot shows the open-e Data Storage Server (DSS) web interface. The top navigation bar includes tabs for SETUP, CONFIGURATION, MAINTENANCE, STATUS, and HELP. Below this, a sub-navigation bar shows various configuration categories: network, administrator, H/W RAID, S/W RAID, Fibre Channel, iSCSI Initiator, hardware, and GUI. The main content area is divided into two columns. The left column contains two sections: 'Interfaces' and 'iSCSI Failover'. Both sections list available network interfaces: eth0, eth1, eth2 (bond0), eth3 (bond0), and bond0. The right column contains three sections: 'Failover Tasks', 'iSCSI Tasks', and 'Failover manager'. The 'Failover Tasks' section has an information message stating that asynchronous replication tasks are not displayed. The 'iSCSI Tasks' section shows a search bar and a list of tasks, with 'Mirror_00' selected. The 'Failover manager' section has an information message stating that no task has been selected. A blue arrow points from the 'iSCSI Tasks' section to the 'Failover Tasks' section, indicating the process of moving tasks. At the bottom of the interface, there is an 'Event Viewer' and a footer that reads 'Data Storage Server. All rights reserved'.

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

8. Start Failover Service

logout **DSS** DATA STORAGE SERVER *open-e*

SETUP CONFIGURATION MAINTENANCE STATUS HELP

network administrator H/W RAID S/W RAID Fibre Channel iSCSI Initiator hardware GUI

Interfaces

- eth0
- eth1
- eth2 (bond0)
- eth3 (bond0)
- bond0

iSCSI Failover

- eth0
- eth1
- bond0

Please note asynchronous replication tasks will not be displayed in this window, as only synchronous tasks can be used for failover.

iSCSI Tasks

Search

Failover Tasks

Search

Mirror_00

apply

Failover manager

start stop

In order to delegate (switch) active server state to the passive server click the Manual failover button. This will initiate a failover event and switch the primary server to suspend mode, while the secondary server will be promoted to active mode. Please note this will stop the volume replication process.

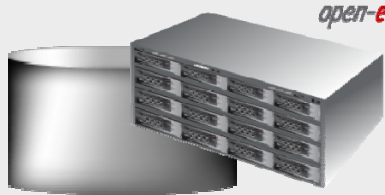
Manual failover

Event Viewer:

Data Storage Server. All rights reserved

At this point both nodes are ready to start the Failover service

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

8. Start Failover Service

After clicking the **start** button configuration of both nodes will be complete

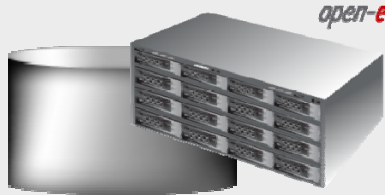
NOTE:

You can now connect via your iSCSI initiator and use your targets via the Virtual IP address e.g. 192.168.10.230 (For example, in a Microsoft Windows environment, download Microsoft iSCSI Initiator ver 2.0 or later).

The screenshot shows the DSS (Data Storage Server) GUI with the following elements:

- Logout** button in the top left.
- DSS DATA STORAGE SERVER** header with the *open-e* logo.
- Navigation tabs: **SETUP**, **CONFIGURATION**, **MAINTENANCE**, **STATUS**, **HELP**.
- Sub-navigation tabs: **network**, **administrator**, **H/W RAID**, **S/W RAID**, **Fibre Channel**, **iSCSI Initiator**, **hardware**, **GUI**.
- Interfaces** section on the left with a list: eth0, eth1, eth2 (bond0), eth3 (bond0), bond0.
- iSCSI Failover** section on the left with a list: eth0, eth1, bond0.
- iSCSI Tasks** and **Failover Tasks** panels on the right, each with a search bar and a list of tasks. The **Failover Tasks** list contains "Mirror_00".
- Failover manager** section at the bottom right, containing:
 - An **Info** message box: "Configuration of both nodes finished successfully." with a green checkmark icon.
 - start** and **stop** buttons.
 - Text: "In order to delegate (switch) active server state to the passive server click the Manual failover button. This will initiate a failover event and switch the primary server to suspend mode, while the secondary server will be promoted to active mode. Please note this will stop the volume replication process."
 - A **Manual failover** button.
- Event Viewer** at the bottom left.
- Footer: "Data Storage Server. All rights reserved."

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

8. Start Failover Service

After start Failover, check the status in **Failover status** function. All must read OK. In the task status, the destination volume must be consistent

iSCSI Failover/Volume Replication



logout **DSS** DATA STORAGE SERVER *open-e*

SETUP CONFIGURATION MAINTENANCE STATUS HELP

network administrator H/W RAID S/W RAID Fibre Channel iSCSI Initiator hardware GUI

Interfaces

- eth0
- eth1
- eth2 (bond0)
- eth3 (bond0)
- bond0

iSCSI Failover

- eth0
- eth1
- bond0

Failover status

Names	Status
Global status	
Service running	ok
Node status	primary/active
Ping node	ok
Communication via:	
bond0	ok
eth1	ok
Task status	
Mirror_00	running
Protocol type: Synchronous	
Connection: Connected	
Source info:	
Logical volume:	lv0000
Consistency:	Consistent
Destination info:	
Logical volume:	lv0000
Consistency:	Consistent
IP address:	192.168.1.221

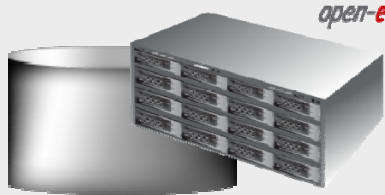
Failover configuration

Info
While a failover is turned on, you cannot make changes to its configuration.

Event Viewer: [icon]

Data Storage Server. All rights reserved

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

9. Test Failover Function

logout **DSS** DATA STORAGE SERVER *open-e*

SETUP CONFIGURATION MAINTENANCE STATUS HELP

network administrator H/W RAID S/W RAID Fibre Channel iSCSI Initiator hardware GUI

Interfaces

- eth0
- eth1
- eth2 (bond0)
- eth3 (bond0)
- bond0

iSCSI Failover

- eth0
- eth1
- bond0

Please note asynchronous replication tasks will not be displayed in this window, as only synchronous tasks can be used for failover.

iSCSI Tasks

Search

Failover Tasks

Search

Mirror_00

apply

Failover manager

start stop

In order to delegate (switch) active server state to the passive server click the Manual failover button. This will initiate a failover event and switch the primary server to suspend mode, while the secondary server will be promoted to active mode. Please note this will stop the volume replication process.

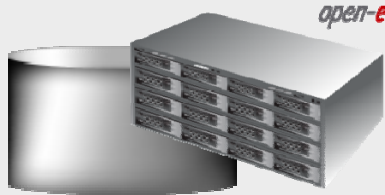
Manual failover

Event Viewer:

Data Storage Server. All rights reserved

In order to test Failover in **Manual Failover** function, click on the **Manual failover** button

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

9. Test Failover Function

The screenshot shows the open-e Data Storage Server (DSS) GUI. The top navigation bar includes 'logout', 'DSS', and 'DATA STORAGE SERVER'. Below this are tabs for 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. A secondary row of tabs includes 'network', 'administrator', 'H/W RAID', 'S/W RAID', 'Fibre Channel', 'iSCSI Initiator', 'hardware', and 'GUI'. The left sidebar has a tree view with 'Interfaces' (listing eth0, eth1, eth2 (bond0), eth3 (bond0), and bond0) and 'iSCSI Failover' (listing eth0, eth1, and bond0). The main content area is divided into two panes: 'iSCSI Tasks' and 'Failover Tasks'. The 'Failover Tasks' pane shows a search bar and a list containing 'Mirror_00'. Below these panes is an 'apply' button. The 'Failover manager' section features an information icon and a message: 'Server is entering suspend mode...'. Below this message are 'start' and 'stop' buttons. At the bottom of the Failover manager section is a 'Manual failover' button. A blue arrow points from a text box on the left to the 'Manual failover' button.

After clicking on the **Manual failover** button, primary node enters suspend mode

Info
Server is entering suspend mode...

start stop

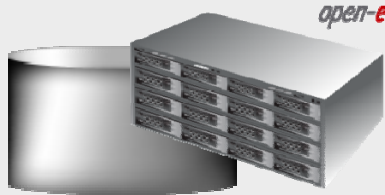
In order to delegate (switch) active server state to the passive server click the Manual failover button. This will initiate a failover event and switch the primary server to suspend mode, while the secondary server will be promoted to active mode. Please note this will stop the volume replication process.

Manual failover

Event Viewer: [icon]

Data Storage Server. All rights reserved

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

9. Test Failover Function

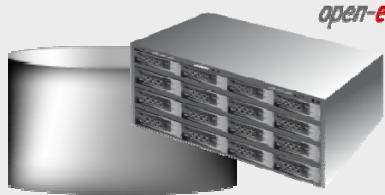
The Failover status function shows the **Global status** of the primary node. Status service is in **suspend** mode and the node is **inactive**.

The screenshot shows the open-e Data Storage Server (DSS) web interface. The top navigation bar includes 'logout', 'DSS', and 'DATA STORAGE SERVER'. Below this are tabs for 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The 'CONFIGURATION' tab is active, and the 'network' sub-tab is selected. The left sidebar shows a tree view with 'Interfaces' and 'iSCSI Failover' sections. The 'Interfaces' section lists 'eth0', 'eth1', 'eth2 (bond0)', 'eth3 (bond0)', and 'bond0'. The 'iSCSI Failover' section lists 'eth0', 'eth1', and 'bond0'. The main content area displays the 'Failover status' and 'Failover configuration' sections. The 'Failover status' section shows a table with the following data:

Names	Status
Global status	
Service running	suspend
Node status	inactive
Ping node	ok
Communication via:	
bond0	unknown
eth1	unknown
Task status	
Mirror_00	stopped

The 'Failover configuration' section includes an information box stating: 'While a failover is turned on, you cannot make changes to its configuration.' Below this, there are checkboxes for 'Enable iSCSI failover functionality' and 'Primary node on localhost'. The 'Secondary node IP' is set to '192.168.2.221' and the 'Ping node IP' is set to '102.169.2.106'. There is also a checkbox for 'Show advanced'.

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS2)
Secondary node
Address IP:192.168.0.221

9. Test Failover Function

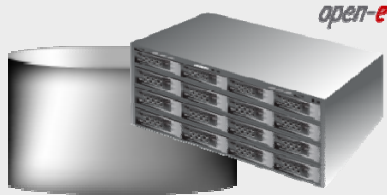
In Failover status function
Global status shows the status
of the secondary node. The
service status is **degraded** and
Node status is active.

The screenshot shows the DSS (Data Storage Server) web interface. The top navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and the 'open-e' logo. Below this is a secondary navigation bar with tabs: 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. Under 'CONFIGURATION', there are sub-tabs: 'network', 'administrator', 'H/W RAID', 'S/W RAID', 'Fibre Channel', 'iSCSI Initiator', 'hardware', and 'GUI'. The 'network' tab is selected, and the 'Interfaces' section is expanded, showing a list of interfaces: eth0, eth1, eth2 (bond0), eth3 (bond0), and bond0. Below this, the 'iSCSI Failover' section is expanded, showing a list of interfaces: eth0, eth1, and bond0. The 'Failover status' section is highlighted, showing a table with the following data:

Names	Status
Global status	
Service running	degraded
Node status	secondary/active
Ping node	ok
Communication via:	
bond0	failed
eth1	failed
Task status	
Mirror_00_reverse	stopped

Below the 'Failover status' section is the 'Failover configuration' section, which includes an 'Info' box stating: 'While a failover is turned on, you cannot make changes to its configuration.' Below this, there are checkboxes for 'Enable iSCSI failover functionality' (checked), 'Primary node on localhost' (selected), 'Secondary node IP:' (102.169.2.106), 'Ping node IP:' (102.169.2.106), and 'Show advanced' (unchecked). The 'Event Viewer' is visible at the bottom left, and the footer text reads 'Data Storage Server. All rights reserved'.

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS2)
Secondary node
Address IP:192.168.0.221

10. Run Failback Function

In order to run Failback in Failover manager function click on the **Sync volumes** button first.

logout **DSS** DATA STORAGE SERVER *open-e*

SETUP **CONFIGURATION** **MAINTENANCE** **STATUS** **HELP**

network administrator H/W RAID S/W RAID Fibre Channel iSCSI Initiator hardware GUI

Interfaces

- eth0
- eth1
- eth2 (bond0)
- eth3 (bond0)
- bond0

iSCSI Failover

- eth0
- eth1
- bond0

Failover manager

Info
Your node is now active

Info
When in secondary mode, the start and stop buttons control this node only. Please use the relevant buttons on the primary node to control both nodes.

start stop

In order to synchronize data from the secondary/active server to the primary server, click the Sync volumes button.

Sync volumes

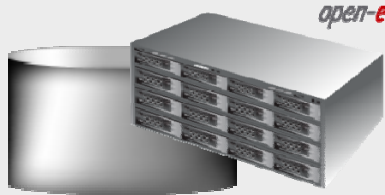
Clicking the Failback button will return the active server state to the primary server, while the secondary server will return to passive mode. Please note this is only possible when the participating volumes are in sync. After the failback has been completed, the primary server is ready for another failover.

Failback

Event Viewer:

Data Storage Server. All rights reserved

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS2)
Secondary node
Address IP:192.168.0.221

10. Run Failback Function

logout **DSS** DATA STORAGE SERVER *open-e*

SETUP CONFIGURATION MAINTENANCE STATUS HELP

network administrator H/W RAID S/W RAID Fibre Channel iSCSI Initiator hardware GUI

Interfaces

- eth0
- eth1
- eth2 (bond0)
- eth3 (bond0)
- bond0

iSCSI Failover

- eth0
- eth1
- bond0

Failover status

Names	Status
Global status	
Service running	degraded
Node status	secondary/active
Ping node	ok
Communication via:	
bond0	failed
eth1	failed
Task status	
Mirror_00_reverse	running
Protocol type: Synchronous	
Connection: Connected	
Source info:	
Logical volume:	lv0000
Consistency:	Consistent
Destination info:	
Logical volume:	lv0000
Consistency:	Consistent
IP address:	192.168.1.220

Failover configuration

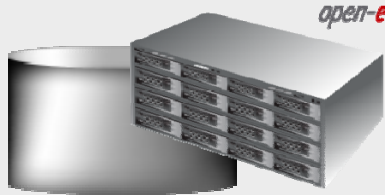
Info
While a failover is turned on, you cannot make changes to its configuration.

Event Viewer: [icon]

Data Storage Server. All rights reserved

After synchronization the task status of the destination volume must be **Consistent**

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS2)
Secondary node
Address IP:192.168.0.221

10. Run Failback Function

logout **DSS** DATA STORAGE SERVER *open-e*

SETUP CONFIGURATION MAINTENANCE STATUS HELP

network administrator H/W RAID S/W RAID Fibre Channel iSCSI Initiator hardware GUI

Interfaces

- eth0
- eth1
- eth2 (bond0)
- eth3 (bond0)
- bond0

iSCSI Failover

- eth0
- eth1
- bond0

Failover manager

Info
Volume replication process started. Please go to Failover Status to check the status of your tasks. ✓

Info
When in secondary mode, the start and stop buttons control this node only. Please use the relevant buttons on the primary node to control both nodes.

start stop

In order to synchronize data from the secondary/active server to the primary server, click the Sync volumes button.

Sync volumes

Clicking the Failback button will return the active server state to the primary server, while the secondary server will return to passive mode. Please note this is only possible when the participating volumes are in sync. After the failback has been completed, the primary server is ready for another failover.

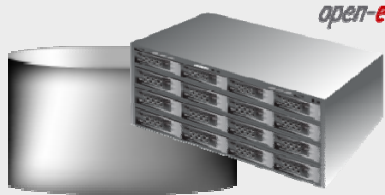
Failback

Event Viewer: [icon]

Data Storage Server. All rights reserved

In order to return the active server state to the Primary server click on the **Failback** button

Synchronous Volume Replication with Failover over a LAN *open-e*



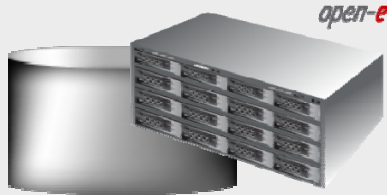
Data Server (DSS1)
Primary node
Address IP:192.168.0.220

10. Run Failback Function

After clicking on **Failback** button (in Failover manager function on Secondary node) Primary node is now active.

The screenshot displays the open-e Data Storage Server (DSS) web interface. The top navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and the 'open-e' logo. Below this is a secondary navigation bar with tabs: 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. A third bar contains specific configuration categories: 'network', 'administrator', 'H/W RAID', 'S/W RAID', 'Fibre Channel', 'iSCSI Initiator', 'hardware', and 'GUI'. The 'network' tab is selected, showing a tree view of 'Interfaces' (eth0, eth1, eth2 (bond0), eth3 (bond0), bond0) and 'iSCSI Failover' (eth0, eth1, bond0). The 'iSCSI Failover' section is expanded, revealing the 'Failover manager' sub-section. This section features a search bar, a list of tasks (currently showing 'Mirror_00'), and an 'apply' button. Below the task list, a status box indicates 'Info: Your node is now active' with a green checkmark. At the bottom of this section are 'start' and 'stop' buttons. A detailed instruction block explains that clicking the 'Manual failover' button will delegate the active server state to the passive server, initiating a failover event and switching the primary server to suspend mode while the secondary server is promoted to active mode, noting that this will stop the volume replication process. The 'Manual failover' button is highlighted in orange. The footer of the interface reads 'Data Storage Server. All rights reserved'.

Synchronous Volume Replication with Failover over a LAN *open-e*



Data Server (DSS1)
Primary node
Address IP:192.168.0.220

10. Run Failback Function

Primary node is active again
and ready for Failover.

iSCSI Failover/Volume Replication



The configuration and testing of
iSCSI Failover/Failback is now
complete.

Web interface for the Data Storage Server (DSS) showing the Failover status and configuration.

Failover status

Names	Status
Global status	
Service running	ok
Node status	primary/active
Ping node	ok
Communication via:	
bond0	ok
eth1	ok
Task status	
Mirror_00	running

Failover configuration

Info
While a failover is turned on, you cannot make changes to its configuration.

☒ Enable iSCSI failover functionality

☒ Primary node on localhost

Secondary node IP: 192.168.2.221

Ping node IP: 192.168.2.106

☐ Show advanced

Event Viewer: [icon]

Data Storage Server. All rights reserved.

Thank You!